REMARKS

Applicants' representatives thank the Examiner for an in-person interview conducted on October 8, 2003 and a telephone interview conducted on November 3, 2003. During the interviews, the Applicants' undersigned representatives discussed the meaning of the terms "bulk doped" and "free standing" in connection with the pending claims and some of the prior art. Specifically, the Examiner had not given what the Applicants believed was appropriate patentable weight to these terms, and the Applicants' representatives pointed to the specification of this application to support their position that these terms should be given patentable weight. No agreement was reached, but this point is believed moot in view of the amendments above and the following remarks. It is believed that this amendment, as well as the remarks above, addresses all substantive points discussed during those interviews. Accordingly, it is believed that this amendment constitutes a complete written statement of the reasons presented in the interviews as warranting favorable action, as required by 37 C.F.R. §1.133.

The Patent Office has renumbered original claims 250-334 as current claims 249-333. The claim numbers, as used in this response, refer to the new claim numbers.

The Patent Office has withdrawn from consideration claims 3, 4, 9-31, 49-55, 102-105, 109, 111, 113-116, 121-174, 176-180, 182, 184, 185, 190, 192, 193 (listed as "103" in the Office Action, believed to be a typographical error), 196-201, 261, and 262.

Claims 203-260 and 263-333, which were also withdrawn from consideration, are now cancelled without prejudice. Applicants reserve the right to file claims to pursue subject matter similar or identical to that of any of the withdrawn claims in one or more divisional applications claiming priority to the instant application.

Claims 77-96 and 202 have been cancelled without prejudice. Applicants reserve the right to file the subject matter of claims 77-96 and 202 in one or more continuation applications claiming priority to the instant application.

Claims 1, 56, 97, 106-108, and 110 have each been amended to recite a device comprising a region having at least four semiconductors, where the semiconductors have a variation in diameter of less than 20%. Support for this amendment can be found throughout the specification, for example, on page 43, lines 12-16, and Figs. 7B, 7E, and 30B. By this amendment, claim 1 includes the limitations of claim 48, claim 56 includes the limitations of

claim 74, and claim 110 includes the limitations of claim 112. Accordingly, claims 48, 74, and 112 have been cancelled. Furthermore, dependent claims 2, 5-8, 32-47, 57-73, 75, 76, 98-101, 117-120, 175, 181, 183, and 186 have been correspondingly amended to provide proper antecedent basis for independent claims 1, 56, 97, and 110. No new matter has been added by any of these amendments.

Applicants have further corrected several minor typographical errors in the claims, including correcting subscripts and adding periods. Claims in which inadvertent typographical errors have been corrected include claims 6, 40, 41, 43-46, 60, 61, 98, and 194. These amendments are typographical in nature, and therefore are not related to patentability. No new matter has been added.

Thus, claims 1, 2, 5-8, 32-47, 56-73, 75, 76, 97-101, 106-108, 110, 117-120, 175, 181, 183, 186-189, 191, 194, and 195 are now pending for examination. Claims 3, 4, 9-31, 49-55, 102-105, 109, 111, 113-116, 121-174, 176-180, 182, 184, 185, 190, 192, 193, 196-201, 261, and 262 remain withdrawn.

Rejections Under 35 U.S.C. §112, ¶1

Claims 99-101 and 106-108 were rejected under 35 U.S.C. §112, ¶1 for failing to comply with the written description requirement. The Office Action asserts that the specification does not provide adequate written description for a "bulk-doped semiconductor that exhibits coherent transport, no scattering, ballistic transport, and/or Luttinger liquid behavior."

At the outset, claims 99-101 and 106-108 are originally filed claims, and thus, it is believed that the claims satisfy the written description requirement at least on this basis. Additionally, the subject matter of these claims described is in the specification, for example, on page 46, and it is believed that one of ordinary skill in the art would understand the meaning of these terms. Accordingly, it is respectfully requested that the rejection of claims 99-101 and 106-108 under 35 U.S.C. §112, ¶1 be withdrawn.

Rejections Under 35 U.S.C. §102(a) in view of Chung

Claims 1, 2, 7, 32-39, 42-48, 56-59, 72-74, 76-83, 85-94, 96-101, 106-108, 110, 117-120, 183, 186-189, 191, 194, 195, and 202 were rejected under 35 U.S.C. §102(a) as being anticipated

by Chung, *et al.*, "Silicon Nanowire Devices," *Applied Physics Letters*, Vol. 76, No. 15, pp. 2068-2070 ("Chung"). The Office Action asserts that the terms "free-standing" and "bulk-doped" are process limitations, not structural limitations; thus, these terms were not given any patentable weight.

Applicants do not agree with the Office Action's assertions that the terms "free-standing" and "bulk-doped" are process limitations, rather than structural limitations. However, this point is believed moot in view of the following.

All claims that stand rejected on this ground now require at least four semiconductors that have a variation in diameter of less than 20%. One way to achieve this is by using catalytic nanoclusters, as described in the present specification, having a relatively narrow size distribution. Nowhere is this feature, or enablement of this feature, found by the Applicants in the disclosure of Chung. It is noted that Chung points to Morales (discussed below) as one way to make their nanowires.

Accordingly, it is believed that independent claims 1, 56, 97, 106-108, and 110, as well as dependent claims 2, 7, 32-39, 42-47, 57-59, 72-73, 76, 98-101, 117-120, 183, 186-189, 191, 194, and 195 are patentable in view of Chung. Accordingly, the withdrawal of the rejection of these claims is respectfully requested.

Claims 48, 74, 77-83, 85-94, 96 and 202 have been cancelled without prejudice. It is respectfully requested that the rejection of these claims be withdrawn.

Rejection Under 35 U.S.C. §102(a) in view of Wolf

Claims 77, 79, and 83-91 were rejected under 35 U.S.C. §102(a) as being anticipated by Wolf, *et al.*, *Silicon Processing for the VLSI Era*, Lattice Press, Vol. 1, pp. 12-13 ("Wolf").

Claims 77, 79, and 83-91 have been cancelled without prejudice, mooting the rejection. Accordingly, Applicants respectfully request that this rejection be withdrawn.

Rejection Under 35 U.S.C. §103(a) in view of Chung

Claims 40-41, 70-71, 75, 95, 112, 175, and 181 were rejected under 35 U.S.C. §103(a) as being unpatentable over Chung.

For at least the reasons explained above with respect to the rejection under §102(a) in view of Chung, the premise of the rejection under §103(a) (that Chung teaches all of the limitations other than those additionally disclosed in claims 40-41, 70-71, 75, 175, and 181, i.e., all of the limitations of independent claims 1, 56, and 110) is believed to be incorrect. Accordingly, while Applicants do not concede that there is a suggestion or motivation in Chung to produce the claimed structures in the manner suggested in the Office Action, the present rejection cannot stand, regardless.

Claims 95 and 112 have been cancelled, mooting the rejection of these claims in view of Chung.

For at least the above-mentioned reasons, withdrawal of the rejection of claims 40-41, 70-71, 75, 95, 112, 175, and 181 is respectfully requested.

Rejection Under 35 U.S.C. §103(a) in view of Morales and Heath

Claims 1, 2, 5-8, 32-48, 56-101, 106-108, 110, 112, 117-120 and 202 were rejected under 35 U.S.C. §103(a) as being unpatentable over Morales, *et al.*, "A Laser Ablation Method for the Synthesis of Crystalline Semiconductor Nanowires," *Science*, Vol. 279, pp. 208-211, 1998 ("Morales"), in view of Heath, *et al.*, U.S. Patent Application Publication No. US 2001/0054709 A1 ("Heath").

Applicants do not see where in Morales is a device comprising at least four semiconductors having a variation in diameter of less than 20% disclosed or suggested. Morales describes laser ablation methods to produce silicon-iron nanoclusters, but does not disclose or suggest methods of controlling uniformity. For example, in Morales, the nanoclusters are described as having diameters that vary between 6 and 20 nanometers (page 209, left column, second paragraph). Heath does not cure the deficiencies of Morales in order to reach the claimed invention. Heath suggests the use of dopant gases, but nowhere discloses or suggests control of nanocluster uniformity. Accordingly, it is believed that independent claims 1, 56, 97, 106-108, and 110 are patentable in view of Morales and Heath, and withdrawal of the rejection of these claims is respectfully requested. Dependent claims 2, 5-8, 32-47, 57-73, 75, 76, 98-101, and 117-120 are believed to be patentable for at least these reasons, and the withdrawal of the rejection of these claims is also respectfully requested.

Claims 48, 74, 77-96, 112 and 202 have been cancelled without prejudice, mooting the rejection of these claims. It is thus respectfully requested that the rejection of these claims be withdrawn.

Rejection Under 35 U.S.C. §103(a) in view of Morales, Heath, and Tans

Claims 175, 181, 183, 186-189, 191, 194 and 195 were rejected under 35 U.S.C. §103(a) as being unpatentable over Morales in view of Heath, and further in view of Tans, *et al.*, "Room-temperature transistor based on a single carbon nanotube," *Nature*, Vol. 393, pp. 49-51 ("Tans").

For at least the reasons explained above with respect to the rejection under §103(a) of Morales in view of Heath, the premise of the rejection under §103(a) (that Morales and Heath teach all of the limitations of claim 110, from which each of claims 175, 181, 183, 186-189, 191, 194 and 195 ultimately depend) is believed to be incorrect. Accordingly, while Applicants do not concede that there would have been any motivation or suggestion to combine Morales, Heath, and Tans in the manner suggested in the Office Action, the present rejection cannot stand, regardless. Thus, the withdrawal of the rejection of these claims under §103(a) is respectfully requested.

CONCLUSION

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after this amendment, that the application is not in condition for allowance, the Examiner is requested to call the Applicants' representatives at the telephone number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicants hereby request any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Respectfully submitted,

By: _____

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